1. (30 points) Construct TMs that accept the following languages. Write the high-level algorithm executed by the machine and label the sections.

(a) The set of strings over \{a, b, c\} that begin with ‘a’, contain exactly two ‘b’s, and end with ‘cc’.
(b) \{a^i b^j c^k \mid i + j = k\}
(c) \{ww \mid w \in \{a, b\}^*\}

2. (5 points) Convert 1362_{10} to binary using two different methods. Show your work (4 points).

3. (5 points) Convert 0.3_{10} to binary. Show the result in 4 bits of precision and 16 bits of precision for the decimal part. Show your work (4 points).

4. (5 points) Create your own example where the associative law fails due to limited precision.

5. (5 points) Create your own example where the distributive law fails due to limited precision.